



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/552,119

10/27/2006

Pierre Carabin

CU-4454 RJS

4070

26530 7590 01/04/2010
LADAS & PARRY LLP
224 SOUTH MICHIGAN AVENUE
SUITE 1600
CHICAGO, IL 60604

EXAMINER

MASHRUWALA, NIKHIL P

ART UNIT

PAPER NUMBER

3749

MAIL DATE

DELIVERY MODE

01/04/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,119	Applicant(s) CARABIN ET AL.	
	Examiner NIKHIL MASHRUWALA	Art Unit 3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Receipt of the applicant's amendment filed on 9/17/2009 is acknowledged.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-12, are rejected under 35 U.S.C. 103(a) as being unpatentable over US pub 2003/0209174 of Cahn in view of US patent 6,119,606 of Clark.

For claim 1 Chan discloses a two-stage plasma process 100 per figs 1-3 for converting waste having organic and inorganic components into fuel gas, which comprises: (a) in the first stage, vitrifying or melting the inorganic components (scrap steel) of the waste and partially gasifying the organic components (other waste) in a gasifier/melter 4 per figs 1-2; and (b) in the second stage, completing the gasification of the organic components so that gas from the first stage of the process entering the

Art Unit: 3749

secondary gasifier 3 per fig 3 (cyclone oxidizer) is exposed to a high temperature such as to transform essentially all soot present in the gas to CO and to convert essentially all complex organic molecules to simpler molecules CO, CO₂ and H₂ (see col 3, lines 45-57 and summary col 3, lines 10-23 for two stage gasification of the waste). Chan does not disclose a dust separation and removal step provided between the first and second stages of the process. Clark discloses a cyclone 62 for dust removal (figs 5A-5B, col 7, lines 21-34) provided between primary stage 10 and secondary stage 20. It would have been obvious for person of ordinary skill in art at the time the invention was made to provide such dust removal cyclone to the process of Chan in view of Clark so as to separate out the dust/heavy particulate from the primary before it enters the secondary combustion stage.

For claim 3, the fuel gas produced in the second stage gasifier 3 is cooled in a heat exchanger 7 & the cooled gas is treated by air pollution control system 8 (see col 7, lines 3-5) and the final by-product gas having high quality combustible synthetic gas can be used for electricity generation (see col 6, lines 59-62).

For claims 4, 6-8 and 26, the first gasification of the waste is carried out in a plasma arc furnace 4 (col 3 line 50) having refractory linings (col 3, line 63) furnace per fig 2 provided with two DC graphite electrodes 15 (col 3, line 51) so as to generate a plasma arc between cathode electrode and scrap steel metal (col 4, lines 25-28). The plasma arc furnace 4 is being preheated to temp above 1500 deg C (col 3, line 62) having a slag layer of such molten inorganic metal at the bottom so as to take it out from spout 33.

For claim 5, second gasifier/cyclonic oxidizer 3 is using a plasma torch 18 (col 3 line 51) with addition of metered amounts of Oxygen, air and/or steam (col 6, line 44-46).

For claim 9, the two-stage plasma system 100 of Chan discloses a process controller 6 to inject metered liquid and gaseous hazardous waste using sensors through atomizing nozzles 30 and 31 and control valves 10 & 11 so as to get achieve gasification of organic material in the waste.

For claim 10, the primary gasifier 4 of Chan discloses a preheated temperature of the furnace above 500 deg C to get the molten scrap metal bath and it obvious to consider much lower temperature for waste gas around 700 to 800 deg C to constitute a cold top for the fresh waste added to the furnace 4.

For claim 18, the gasifier 4 shows to maintain a negative pressure using an exhaust fan (col 5, lines 22-26).

For claim 19, the process 100 has a very high temperature so as to prevent formation of dioxin (col 5, line 12-13).

3. Claims 13-17 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan and Clark as applied to claim 1 above and further in view of US patent 5,960,026 of Nolting et al.

For claims 13 and 15 , even though the secondary gasifier 3 of Chan has a cyclonic plasma torch oxidizer having a oxidization reaction efficiency to be increased by intense internal mixing between by-product gas and injected atomized oxygen and steam caused by vigor of cyclonic action with the gasifier 3 (col 5, lines 54-58) and

Art Unit: 3749

plasma temperature up to 5000 deg C (col 6, lines 27-43) using plasma arc 18 to destroy carbon blank/soot and fugitive toxic materials, it does not have a fire eductor. Nolting discloses an eductor 16 with a plasma torch 18 inside for an efficient thermal gasification of the waster per figs 1-2. It would be obvious for person of ordinary skill in the art to provide such eductor with plasma electrode to Chan in view of Nolting so as to do additional thermal gasification of the waste with better exposser.

For claim 14, Chan discloses a minimum temperature of 1350 deg C for second gasifier and it would merely choice in design per ordinary skill in the art to have temperature of about 900-1300 deg C for the furnace to get gasification while primary gas enters the second stage.

For claims 16-17, the heat exchanger 7 of Chan would be considered to lower the out going gas temperature from the second stage 3 to be below 100 deg C so as to freeze the thermodynamic equilibrium of the fuel has and avoid production of secondary pollutants. The air pollution control system 8 of Chan discloses final cleaning of the gas.

For claims 20-22, the claimed combination of Chan, Clark and Nolting discloses most limitations (disclosed in claims 1-19). Moreover, Chan discloses the second plasma torch gasifier 3 with a refractory lining 32 per fig 3 for insulation against high temperature and primary gasifier 4 uses two graphite electrodes 15 so as to create two arcs.

4. Claims 11 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang and Clark as applied to claim 1 above and further in view of US patent 5,451,738 of Alvi et al. Neither Chan nor Clark discloses a recycle of the dust separator.

Art Unit: 3749

Alvi discloses a recycling of the dust scrubber/cyclonic 24 (for cleaning the processed gas and the cleaned dust particles) per shown as dotted line in diagram 1 from scrubber 26 to the primary reactor 14. It would be obvious for a person of ordinary skill in the art to provide such recycle cyclonic scrubber to Chan in view of Alvi so as to recycle some light particles so as to get better thermal efficiency from the waste combustion.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NIKHIL MASHRUWALA whose telephone number is (571)270-3519. The examiner can normally be reached on Monday thru Friday- 7:30am-5:00pm.

Art Unit: 3749

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nikhil Mashruwala/
Examiner, Art Unit 3749

/Steven B. McAllister/
Supervisory Patent Examiner, Art Unit 3749